Approved Water Management Plan

for the

South Saskatchewan River Basin

(Alberta)

August 2006

Alberta Environment

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Acknowledgements

The Alberta Government offers a special thank you to the members of the four basin advisory committees (Red Deer River, Bow River, Oldman River and South Saskatchewan River). The members, many of whom were volunteers, devoted much time and effort to learning about the water management issues in the South Saskatchewan River Basin (SSRB), discussing the issues, and arriving at recommendations. Their recommendations formed the basis for this plan.

The committees accepted the challenge of working within a constrained terms of reference and through two phases of this plan. They worked long and hard to arrive at a consensus based set of recommendations that will improve water management in the SSRB. This bodes well for the success of future planning to address watershed issues at the sub-basin level – issues that this plan was unable to deal with because of the need to focus first on water quantity in the main rivers.

Thank you also to the many government employees whose contributions made the plan a reality. Their leadership roles and expertise as resource persons were invaluable. A special thank you goes to Doug Ohrn for coordinating the entire effort for this plan since 2001.

EXECUTIVE SUMMARY

This plan reflects a balance between protecting the aquatic environment and water allocation of rivers in the South Saskatchewan River Basin (SSRB). Albertans were asked for their views on the direction water management should take in the SSRB and their comments and concerns were carefully considered in the preparation of this document.

The plan will provide guidance to decision makers and act as a foundation for future watershed management planning of sub-basins in the SSRB by Watershed Planning and Advisory Councils, as well as stewardship groups. It recognizes and accepts that limits for water allocations have been reached or exceeded in the Bow, Oldman, and South Saskatchewan River Sub-basins. It is also recognized that the limit of the water resource will be reached in the Red Deer River Sub-basin.

The principal recommendations contained in this plan are:

- Alberta Environment (AENV) no longer accept applications for new water allocations in the Bow, Oldman and South Saskatchewan River Sub-basins until the Minister of Environment specifies, through a Crown Reservation, how water not currently allocated is to be used.
- Water be allocated from the Crown Reservation only for:
  - Water conservation objectives;
  - Storage of peak flows to mitigate impacts on the aquatic environment and to support existing licences. (Alberta Environment will assist the Watershed Planning and Advisory Councils in evaluations of the potential for on-stream and off-stream storage.);
  - Licences and registrations that may be issued for applications and registrations pending at the date of the Crown Reservation[1]. (This does not necessarily imply approval; but the pending applications and registration will be reviewed.);
  - First Nations Reserves.

- When allocations in the Red Deer River Sub-basin reach 550,000 cubic decametres, a thorough review be conducted to identify the maximum allocation limit.

Other recommendations and provisions included are:

- A committee be formed to provide water management coordination recommendations across the SSRB. The membership should include representation from the Watershed Planning and Advisory Councils in the Bow, Oldman and Red Deer Sub-basins and the South Saskatchewan River Sub-basin.

- AENV continue to manage the SSRB as a whole, in order to meet the *Master Agreement on Apportionment* requirements. It is recommended that the aforementioned committee prepare an apportionment operations plan for consideration by the Director under the *Water Act*.

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[1] This includes:

- Little Bow Project/Highwood Diversion Plan within the provisions for the project as set by the Natural Resources Conservation Board/Canadian Environmental Assessment Agency Joint Review Panel regarding NRCB Application 9601, May 1998;
- Pine Coulee Water Management Project within the provisions for the project as set by the Natural Resources Conservation Board/ Environmental Assessment Review Process Joint Review Panel regarding NRCB Application 9401, February 1995.

- AENV establish Water Conservation Objectives (WCOs) for the Bow, Oldman and South Saskatchewan River Sub-basins. Any licences issued for applications received after May 1, 2005 be subject to the following WCO:

  The WCO should be 45% of the natural rate of flow, or the existing instream objective plus 10%, whichever is greater at any point in time.

  Additional recommendations concerning WCOs in these sub-basins are contained in the plan.

- AENV establish WCOs for the Red Deer River Sub-basin. Any licences issued for applications received after May 1, 2005 be subject to the following WCOs:

  Upstream of the confluence with the Blindman River, to Dickson Dam:

  - For new licences or existing licences with a retrofit provision, a rate of flow that is 45% of the natural rate of flow, or 16 cms, whichever is greater at any point in time.

  Downstream of the confluence with the Blindman River:

  - For future licences that withdraw from November to March inclusive, a rate of flow that is 45% of the natural rate of flow, or 16 cms, whichever is greater at any point in time.
  - For future licences that withdraw from April to October inclusive, a rate of flow that is 45% of the natural rate of flow, or 10 cms, whichever is greater at any point in time.
  - For existing licences with a retrofit provision, a rate of flow that is 45% of the natural rate of flow, or 10 cms, whichever is greater at any point in time.

- The *South Saskatchewan Basin Water Allocation Regulation* (1991) be repealed.

- The Director is authorized to consider applications for transfers of water allocations.

- The Director is authorized to withhold up to 10% of the volume of water being transferred, if it is considered to be in the public interest to protect the aquatic environment or to implement a WCO.

- The Director consider the Matters and Factors provided in this plan in making decisions on applications for licences, preliminary certificates, approvals, or transfers of an allocation of water.

- To improve the efficiency, effectiveness and productivity of water use in the Bow, Oldman, and South Saskatchewan River Sub-basins, three broad avenues be followed by AENV and water users.
  - Continue to improve water management and administration of water allocations.
  - The development of water markets and transfers.
  - Encourage improvements in water conservation by water users.

- Watershed Planning and Advisory Councils (WPACs) are encouraged to consider the planning priorities in their watersheds and undertake future watershed management planning with this water management plan as a foundation.

1. Background

1.1 Introduction

This is the Approved Water Management Plan for the South Saskatchewan River Basin (SSRB), which comprises the Red Deer, Bow, Oldman, and South Saskatchewan River Sub-basins within Alberta (Figure 1). The plan applies to all of the named rivers, their tributaries and all natural surface water with hydrological connection to the named rivers and tributaries. Groundwater that readily flows naturally under the ground to these surface water bodies is also considered surface water.

The plan is an amendment of the Phase One Approved Water Management Plan for the SSRB, approved by the Lieutenant Governor-In-Council in June 2002.

Careful consideration was given to Albertans' views on the direction water management takes in the SSRB and the plan was prepared in response to that information. As circumstances change and information that reflects the broad interests and values of the public continues to be available, the plan will evolve through future planning cycles to reflect this. This plan also provides the foundation for future watershed management planning for sub-basins in the SSRB.

This Approved Water Management Plan for the SSRB is critically important at this point in time. It defines how water should be respected now and into the future. It brings clarity to questions that have been posed for many years. The aquatic environments of all the rivers have a demonstrated need for protection, while the economy of Southern Alberta depends on water for its life blood. A growing population and economy are putting unprecedented pressures on the water resource, on the aquatic environment and on the security of existing allocations. The intent of this plan is to accelerate the steps the citizens of the SSRB have already taken on the path towards a sustainable economy and environment.

The plan also sets the stage for future changes to how water management is conducted. Strong linkages between water quality, land use and water quantity may now be further pursued. It is anticipated that economic tools will continue to influence how water is distributed for use generally and particularly during times of shortage. Greater emphasis will also be placed on ensuring environmental considerations are taken into account. Improved cooperation between all stakeholders is expected and encouraged to occur.

The key objectives of the planning process were to:

- Provide a strategy for a publicly acceptable balance between water consumption and environmental protection in the SSRB, including establishing Water Conservation Objectives (WCOs) and the volume of water that may be available for future allocation;
- Review the 1990 *Water Management Policy for the SSRB*;
- Review the 1991 *South Saskatchewan Basin Water Allocation Regulation*; and
- Determine the Matters and Factors the Director considers in making decisions on applications for approvals, preliminary certificates, licences, or transfers of water allocations.

The plan authorizes and/or recommends the use of:

- Water allocation transfers (previously approved in Phase One).

- Water conservation holdbacks (previously approved in Phase One).
- Water Conservation Objectives.
- Section 53 of the *Water Act*, which permits a decision to be made to stop accepting applications for water allocations for a period of time.
- Section 35 of the *Water Act* to implement a Crown Reservation of water that allows the Minister of Environment to specify how currently unallocated water should be used.
- Matters and Factors for mandatory consideration by the Director in processing applications for licences and transfers.

The planning process was guided by a Steering Committee with representatives from Alberta Environment, Alberta Agriculture, Food and Rural Development and Alberta Sustainable Resource Development. Fisheries and Oceans Canada also had an observer on the Steering Committee.

The public consultation process is described in Appendix A. Basin Advisory Committees (BACs) were integral to this process and their report, "Water Management Recommendations, July 2004," established the general direction of this plan. AENV requested that the BACs focus only on water quantity issues. Several water management issues, such as water quality, will be addressed by the Watershed Planning and Advisory Councils (WPACs) in the future. Alberta Environment also consulted with potentially affected First Nations.

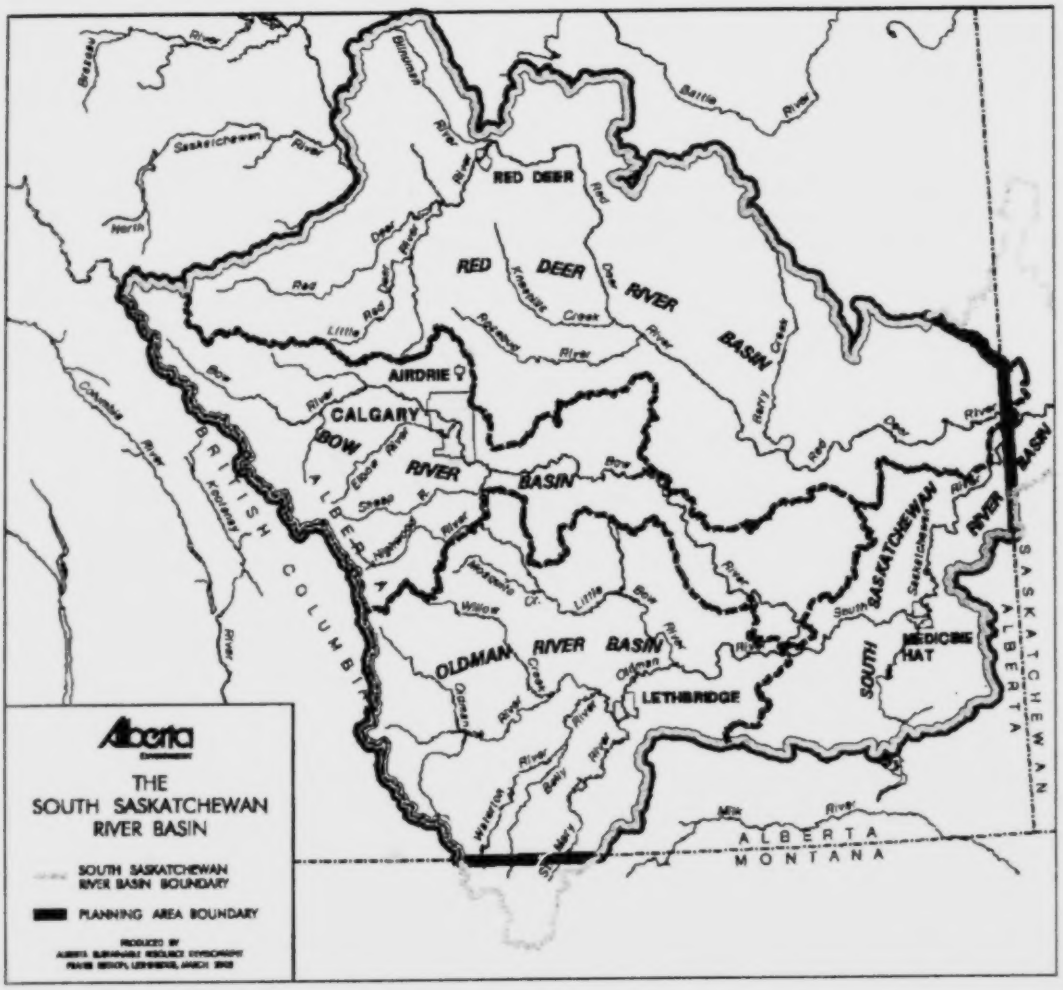

Figure 1: The SSRB Planning Area

1.2 Context for the Plan and Issues Considered

In Alberta, our quality of life – and life itself – depends on having a safe and sustainable water supply for the environment, our communities, and our economic well-being. Population growth, and agricultural and industrial developments are increasing the demand and pressure on Alberta's water supplies and aquatic environments. Nowhere in Alberta is this more apparent than in the SSRB.

1.2.1 Context for the Plan

During the past 100 years, large amounts of water have been allocated to irrigation and communities, to promote the settlement of southern Alberta. This water is used to support the economy, culture and way of life. Industries, municipalities and individual families have made large investments to utilize this water and create economic benefit. The overall economy and individual communities are further supported by significant water infrastructure owned and operated by irrigation districts and the provincial government.

As more water was allocated and as each allocation was more fully utilized, impacts on the aquatic environment became apparent. Within the last decade, the extent of this impact has become widely recognized, though complete understanding is still in the future.

Assessments of the condition of the river reaches within the SSRB indicate that the aquatic environment of lower reaches of all the rivers except the Red Deer show varying degrees of impact. All reaches are at least moderately impacted, some are heavily impacted and a few degraded. As the existing allocations are more completely utilized, the condition of these reaches is expected to further decline. Also, as these allocations are more completely utilized, there is an increased risk that existing licences will not receive their full water allocation of water in drier years.

Given this understanding of the water supply, allocations and condition of the aquatic environment, it is recognized that the Bow, Oldman and South Saskatchewan River Sub-basins have reached their limit of allocations and the limit for the Red Deer River Sub-basin is in the not-too-distant future (three or four decades).

Historically, Alberta has passed approximately 75% of the annual total natural discharge of the SSRB to Saskatchewan. The requirement of the *Master Agreement on Apportionment* is 50%. However, as existing licences and new allocations from the Red Deer River are more fully utilized, the volume of water passed on to Saskatchewan is predicted to decline to 50 to 60%, in at least half the years.

The significant amount of water already allocated, the full utilization of this allocated water in the future, the obligation to pass water to neighboring provinces, the current and anticipated impact on the aquatic ecosystems and the threat of impacts due to climate change signal that changes to the direction of water management in the SSRB must take place. Given these limits that have been reached and the infrequent high flows that are not already accounted for in current allocations the construction of new storage to support additional water allocations is not the simple solution it is commonly believed to be. The SSRB must move into a new era of water conservation, efficiency and effectiveness where the large amount of water that is already allocated is managed and used to meet the needs of both the aquatic ecosystem and communities. This plan starts the movement into this new era.

1.2.2 Issues Considered

In view of the significant private and public investment and the foundational role this water use plays in the prosperity of the communities of southern Alberta, a given for the planning process was that no licence be cancelled for the sole reason of accomplishing recommended outcomes of the water management plan. Administration of water allocations by AENV will continue to use the full suite of tools in the *Water Act*.

Existing water storage within the SSRB was considered during the preparation of this plan. This storage provides water to communities and irrigators, produces hydropower, reduces the risk of water shortages during drier years, reduces impacts to the aquatic environment, improves water quality, and provides recreational opportunities. However, the capacity of existing storage and the ability to provide these benefits has reached its limit. The water captured in this storage is being fully utilized.

During development of this plan a number of questions arose about the availability of water in the SSRB for all uses, including the aquatic environment. These uses include:

- Meeting water demand and consumption:
  - Increasing demand for water, relative to supply;
  - Water needs of First Nations;
  - The suitability of the limits on water allocations to irrigation;
  - Significant water supply risks to new licence holders in the Bow, Oldman, and South Saskatchewan River Sub-basins;
  - Alberta's ability to meet the *Master Agreement on Apportionment*; and
  - Differences in sub-basin water contributions required for meeting the *Master Agreement on Apportionment*.

- Protecting the aquatic environment:
  - Poor and declining health of the aquatic environment in portions of the SSRB;
  - Increased stress on the aquatic environment as use of existing licences increases;
  - Significant imbalances in some parts of the basin between water consumption and flows required to sustain functioning aquatic environments;
  - Negatively affected riparian vegetation due to water diversion, storage, and land use management; and
  - Knowledge gaps concerning how the aquatic environment (which includes riparian vegetation) responds to changes in river flow regimes (e.g., measuring performance of flow restoration efforts or allocation).

2. Recommendations and Provisions

Recommendations in this plan represent advice to the Minister of Environment and the Director, who are solely responsible for making decisions under the *Water Act*. Additional provisions described in this plan are other actions to be taken by the Alberta government or by partnerships that include the Alberta government.

Recommendations and provisions are made on the following main topics:

- Limits of the water resource;
- Water Conservation Objectives;
- Steps to increase flows in the highly allocated rivers;
- Allocations from the Red Deer River Basin;
- Sub-basin contributions to the Master Agreement on Apportionment;
- Water allocation transfers;
- Water conservation holdbacks;
- Matters and Factors that must be considered in making decisions; and
- Broad water management strategies for the future, especially those concerning water demand and consumption and the aquatic environment.

2.1 Establish a Limit on Water Allocation from the Bow, Oldman, and South Saskatchewan River Sub-basins

Recommendations

- That AENV stop accepting applications for new water allocations in these sub-basins until the Minister of Environment specifies, through a Crown Reservation, how water not currently allocated is to be used.
- The Crown Reservation be established for the entire Bow, Oldman and South Saskatchewan River Sub-basins to make unallocated water available for the following purposes:
  - Water Conservation Objectives;
  - Storage of peak flows to mitigate impacts on the aquatic environment and to support existing licences. (Alberta Environment will assist the Watershed Planning and Advisory Councils in evaluations of the potential for on-stream and off-stream storage.);
  - Licences and registrations that may be issued for applications and registrations pending at the date of the Crown Reservation[1]. (This does not necessarily imply approval; but the pending applications and registrations will be reviewed.);
  - First Nations Reserves.

[1] This includes:

- Little Bow Project/Highwood Diversion Plan within the provisions for the project as set by the Natural Resources Conservation Board/Canadian Environmental Assessment Agency Joint Review Panel regarding NRCB Application 9601, May 1998;
- Pine Coulee Water Management Project within the provisions for the project as set by the Natural Resources Conservation Board/ Environmental Assessment Review Process Joint Review Panel regarding NRCB Application 9401, February 1995.

Rationale

It has been determined during preparation of this plan that the limits for water allocations have been reached or exceeded in the Bow, Oldman, and South Saskatchewan River Sub-basins and flow regimes have been altered by water diversions. This has created risks for both water users and the aquatic environment. In drier years, low priority licences are not able to receive their total allocations. Existing diversions have also adversely affected the aquatic environment, including the riparian vegetation, in the Bow, Oldman, and South Saskatchewan River Sub-basins. Increased withdrawals of water within existing licences further degrade aquatic ecosystem health. Issuing more licences compounds these adverse aquatic effects and increases risk to existing licences.

The need to curtail further allocations and make existing allocations more efficient and effective has been made more urgent by the economic development that is taking place in the SSRB.

2.2 Future Water Allocation Limit in the Red Deer River Sub-basin

Recommendation

A limit is not proposed for allocations from the Red Deer River Sub-basin at this time, however there is sufficient information to cause concern about the potential risk to both licences and the aquatic environment as increased volumes of water are withdrawn.

It is recommended that an allocation volume of approximately 600,000 dam^3 (cubic decameters) be considered the initial total allocation target. When allocations reach 550,000 dam^3, a temporary closure to applications to permit a review of the aquatic environment and allocations should be undertaken. Once the review is complete, a Crown Reservation should be created for the Red Deer River Sub-basin to reserve water for the aquatic environment and other identified purposes. The identified purposes will determine the allocation limit. The review should consider:

- Present and projected state of the aquatic environment.
- Present and projected reliability of licences (factoring in existing and potential water storage).
- Where there is a condition in the licences, the degree to which return flow from water users is benefiting the aquatic environment and licence reliability.
- Future water demands.
- The purposes allowed for future allocations in the Crown Reservation.

Rationale

The Red Deer River has fewer allocations than other rivers in the SSRB and, hydrologically, has the healthiest aquatic environment. The recommended total allocation target of 600,000 dam^3 is predicted to support future growth for the next 40 years. The setting of a total allocation in the future will:

- Prevent the issuance of licences where there is an unacceptably high risk of full allocations not being available in drier years;
- Limit or reduce possible future risks to existing licences; and
- Avoid the degree of environmental degradation that has occurred in other rivers in the SSRB.

2.3 Recommended Water Conservation Objectives (WCOs)

The WCOs recommended in this plan provide direction on opportunities to increase flows in the highly allocated rivers in the Bow, Oldman and South Saskatchewan River Sub-basins and permit allocations in the Red Deer River Sub-basin. They are subject to future review and refinement in light of improved knowledge and information about the aquatic environment and water quality.

It was determined that an implementation date for new WCOs needed to be incorporated into the plan as effects on the aquatic environment became clear and as the plan became common knowledge. There was a need to protect the aquatic environment and to prevent speculation on water allocations. This date was determined to be May 1, 2005, based on imminent plans at the time for the draft SSRB plan going out to public consultation.

2.3.1 Upstream WCOs

This plan was developed on the basis of recommending WCOs for the mainstem rivers, downstream of major dams or diversions. However, it became apparent during the planning process that mainstem WCOs should also apply to headwater reaches and tributaries. It is recommended that when a WCO is to be established for headwater reaches and tributaries to the mainstem that it not be less than existing instream objectives or the WCO downstream on the mainstem, whichever is greater. Given the recommendations in this plan, it is unlikely that further water management planning is needed to establish WCOs in any parts of the Bow, Oldman and South Saskatchewan sub-basins.

2.3.2 Bow, Oldman and South Saskatchewan River Sub-basins WCOs:

The recommended WCOs will serve as an administrative tool that will foster opportunities to increase flows. These opportunities could include holdbacks from transfers, voluntary actions by licence holders, cancellations, and purchases of transfers. These WCOs will serve on an interim basis until monitoring, research and public consultation identify a long-term WCO.

The recommended WCOs are either 45% of the natural rate of flow, or the existing instream objective increased by 10%, whichever is the greater at any point in time.

Recommended application of the WCO

- WCO for all storage licences under the Crown Reservation should be the existing instream objective plus 10% at any point in time.
- The existing instream objective or WCO should continue to be a condition on existing licences for which off-stream storage is constructed, to increase use of existing allocations.
- All existing licences should retain their original conditions for instream objectives.
- Renewed licences should retain conditions regarding previous instream objectives.
- New licences stemming from applications received before May 1, 2005 should be given conditions for instream objectives that existed on May 1, 2005.
- Transfers should carry the condition for instream objectives of the original licence.
- The recommended WCOs should not apply to the current operating conditions for existing dams and weirs.

Rationale

The lower reaches of these rivers have aquatic environments that have been impacted by water diversions. These WCOs, combined with the set limits on water allocations, are the first steps toward restoration of the aquatic environments.

The figure of 45% of the natural rate of flow (combined with the existing instream objectives) will provide an adequate target to increase flows for many years.

The recommended WCO of the existing instream objective, plus 10% during very high flows, (i.e. spring freshet) will enable the diversion of at least some runoff into storage for the purposes identified in this plan. The physical ability to capture and store water during the high flow events will always be limited. Storage would be more effective if there is a severe decline in peak runoff in the future and total runoff is spread over a longer period. Capturing even a relatively small proportion of a high flow could amount to a substantial volume of water. However, commitments to apportionment and existing licences will constrain the volume of water available for storage in most years.

2.3.3 Red Deer River Sub-basin WCOs:

From the Dickson Dam to the confluence with the Blindman River, it is recommended that the WCO for any applications received or licences issued after May 1, 2005 and for existing licences with a retrofit provision be:

- A rate of flow that is 45% of the natural rate of flow, or 16 cms (cubic metres per second), whichever is greater at any point in time.

From the confluence with the Blindman River to the Saskatchewan border, it is recommended that the WCO:

- For future licences for withdrawals from November to March, inclusive, be:
  - A rate of flow that is 45% of the natural rate of flow, or 16 cms, whichever is greater at any point in time.
  - That this WCO apply to any applications received or licences issued after May 1, 2005.

- For future licences for withdrawals from April to October, inclusive, be:
  - A rate of flow that is 45% of the natural rate of flow, or 10 cms, whichever is greater at any point in time.
  - That this WCO apply to any applications received or licences issued after May 1, 2005.

- For existing licences with a retrofit provision, be:
  - A rate of flow that is 45% of the natural rate of flow, or 10 cms, whichever is greater at any point in time.

It is recommended that renewed licences retain their previous conditions for instream objectives.

Rationale
This WCO will permit water diversion for economic development in the Red Deer River Sub-basin, while limiting negative impacts on the aquatic environment.

Operating practices for the Dickson Dam continue to be improved and enhanced. The highest priority in the operation of the Dickson Dam is to provide a year-round minimum release of 16 cms. This is the flow presently required for meeting water quality standards for dissolved oxygen during the winter and is necessitated by historic, natural, winter water quality problems and current nutrient loadings from point and non-point sources.

This WCO will require future water allocation licences, particularly those requiring year-round diversion, to include water storage, as water is not likely to be available for diversion during the winter months.

2.4 Repeal the South Saskatchewan Basin Water Allocation Regulation (1991)

Recommendation
The Regulation be repealed.

Rationale
The recommendations and provisions of this plan supersede the 1991 Regulation with the exceptions noted. Almost all irrigation projects in each sub-basin have been allocated, or have applied for the volumes of water that the Regulation permitted. In the case of the Red Deer River, it is felt that economics could dictate whether further allocations for any purpose should occur, until a Crown reservation is created for specific purposes.

The Irrigation Districts Act governs the potential area expansion of irrigation districts, with their existing allocations.

2.5 Establishment of an Interbasin Water Coordinating Committee

To promote coordination between the sub-basins on matters of common interest, an Interbasin Water Coordinating Committee will be established. It will have representation from the Watershed Planning and Advisory Councils in the SSRB and from the South Saskatchewan River Sub-basin. Alberta Environment will also have membership.

This committee will provide advice to Alberta Environment on managing water during periods of water shortage in any or all of the sub-basins. This committee is to meet at least annually or on as frequent a basis as necessary to review and address matters regarding water shortage situations and how to best meet the requirements of the *Master Agreement on Apportionment*. The Director will make any applicable decisions.

2.6 *Master Agreement on Apportionment* (1969)

Provisions
- All of the sub-basins on the SSRB continue to be managed as a single entity in order to meet the requirements of the *Master Agreement on Apportionment*.
- An apportionment operations plan be developed to identify criteria for decisions how Alberta will meet its flow obligations to Saskatchewan. A key principle is to achieve fair and equitable sharing of water between the sub-basins, such that during times of shortage the

licence holders of one sub-basin do not carry an excessive burden for the benefit of licence holders in other sub-basins.

- It is recognized that in strict legal terms, a senior licence could call priority in one sub-basin, but because of insufficient junior licences, insufficient water storage, and apportionment issues in that sub-basin, this could result in a more junior licence in another sub-basin being negatively affected. However, the likelihood of this occurring is very remote, as other options, such as calling on stored water in the Oldman River Dam reservoir, will usually be available. With some foresight, the committee should easily be able to avoid a strict priority situation.
- The principle of sharing water during shortages should take precedence, so licences in the water-short basin(s) are affected first. The proportion of contribution should consider the following in each sub-basin:
  - Amount of storage capacity and amount of water in storage
  - Location of storage
  - Snow pack
  - Volume of licences affected
  - Sub-basin natural flows.
- The Alberta Government will consider the advice of the SSRB Interbasin Water Coordinating Committee to meet apportionment obligations under the Master Agreement on Apportionment.
- The public should be provided with information on a regular basis as to the committee's recommendations. AENV should submit an annual report to the public on its activities with respect to meeting apportionment.

Rationale

Under the 1990 *SSRB Water Management Policy*, the basin has operated as a single unit to meet requirements of the *Master Agreement on Apportionment*. This permits flexibility in drawing on the sub-basins in response to annual variations in water supply and demand, while striving to achieve balance and equity in the contribution of the sub-basins.

It is recognized that options are limited in the Bow River sub-basin due to the absence of government-owned storage and in the Red Deer River sub-basin due to limited flexibility of available storage.

2.7 Use of Water Allocation Transfers, Water Conservation Holdbacks and Factors that Must be Considered When Making Decisions.

Some water management tools provided by the *Water Act* require authorization by an Approved Water Management Plan. The SSRB Approved Water Management Plan, Phase One (2002) authorized water allocation transfers and water conservation holdbacks. This Approved SSRB Water Management Plan continues these authorizations, as detailed below.

2.7.1 Water Allocation Transfers

The Director (as designated under the *Water Act*) is hereby authorized to consider applications to transfer water allocations under licences in the SSRB in Alberta, subject to sections 81, 82 and 83 of the *Water Act*.

In order for a transfer to proceed, an application for the transfer must be submitted to AENV. The designated Director decides whether the transfer will be allowed. If a transfer is allowed to

proceed, then a new licence is issued for the transferred allocation. The Director may attach conditions to the new licence, however, the priority of the transferred water is maintained.

Under sections 11(3) (a) and 82(5) of the *Water Act*, an Approved Water Management Plan will identify the Matters and Factors that must be considered by the designated Director in making a decision on an application for a water allocation transfer. The Matters and Factors that must be considered in the SSRB are listed in Table 1.

Only allocations of "licences in good standing" may be transferred (see definition in Glossary). Under the *Water Act* (81(6)), proposed transfers must undergo public review. The applicant for a transfer must also provide public notice of the application. Directly affected parties may submit statements of concern.

AENV will maintain a public list of water allocation licences to assist interested parties in arranging transfers. This list will include the volume and priority for each licence.

Rationale
In highly-allocated basins, water allocation transfers are a means by which a reliable (high priority) water allocation could be obtained, provided a party willing to transfer all or part of their allocation could be found. This would enable a new enterprise to locate in these basins, to the benefit of the economy. The ability to transfer part of an allocation for financial benefit provides an incentive for existing licence holders to increase water use efficiency.

2.7.2 Water Conservation Holdbacks

The Director is hereby authorized to withhold up to 10 per cent of an allocation of water under a licence that is being transferred, if the Director is of the opinion that withholding water is in the public interest to protect the aquatic environment or to implement a Water Conservation Objective.

Water conservation holdbacks permit up to 10% of the volume of a transferred allocation to remain in the river for the benefit of the aquatic environment or to implement a WCO. The withheld water may be also reserved (section 35 of *Water Act*) or added to an existing reservation.

Section 83(1) of the *Water Act* states:
If the Director is of the opinion that withholding water is in the public interest to protect the aquatic environment or to implement a Water Conservation Objective, and the ability to withhold water has been authorized in an applicable approved water management plan or by order of the Lieutenant Governor in Council, the Director may withhold up to 10% of an allocation of water under a licence that is being transferred.

It is recommended that the Director withhold 10%, unless there is a compelling reason to withhold less.

It is recommended that withheld water remain in the river through a WCO licence or become part of the Crown Reservation.

Rationale
Water conservation holdbacks could help increase the flows of highly-allocated rivers by a small amount, or at least help offset increases in water use by the new licence holder.

2.7.3 Matters and Factors that Must be Considered in Making Decisions on Applications for Licences, Preliminary Certificates or Approvals

The *Water Act* contains provisions (sections 11(3) (a) and 51(4)) for an Approved Water Management Plan to identify Matters and Factors that must be considered by the AENV designated Director in making decisions on applications for water licences, preliminary certificates or approvals. The Matters and Factors that must be considered in the SSRB are listed in Table 2.

Table 1. Matters and Factors that must be considered in making decisions on applications for a transfer of an allocation of water under a licence in the SSRB

Matters and Factors	Guidelines
Existing, potential and cumulative effects on the aquatic environment.	• No significant adverse effect on the aquatic environment
Existing, potential and cumulative effects on any applicable instream objective and/or WCO	• No significant adverse effect on existing instream objectives and/or Water Conservation Objectives
Efficiency of use	• Industry standards and best practices.
Net Diversion (See Definition)	• Quality and timing of return flow should be benign or beneficial for environment • Only net use portion of the allocation is transferable, unless new user has a net consumption operation.
Existing, potential and cumulative hydraulic, hydrological and hydrogeological effects	
Existing, potential and cumulative effects on household users, traditional agriculture users and other higher and lower priority licensees	• From the *Water Act*, Section 82(3)(b): *the transfer of the allocation, in the opinion of the Director, does not impair the exercise of rights of any household user, traditional agriculture user or other licensee other than the household user, traditional agriculture user or other licensee who has agreed in writing that the transfer of the allocation may take place*
With respect to irrigation, the suitability of the land to which the allocation of water is to be transferred for irrigated agriculture	• The land must be suitable for irrigated agriculture: Class 4 or better in accordance with the standards of Alberta Agriculture, Food and Rural Development
The historic volume, rate and timing of the diversion under the original and proposed licence	
Location of the existing diversion and the proposed new diversion	
Water quality (including public health and safety and assimilative capacity)	• No significant adverse effect on public health and safety. • No significant adverse effect on assimilative capacity
Linkages between surface and ground water and the effects or changes in overall water use	• No significant adverse effect on groundwater quantity or quality
Existing, potential and cumulative effects on the operation of reservoirs or other water infrastructure	• No significant adverse effect on operations unless the reservoir or infrastructure licensee agrees it is feasible to adjust operations to mitigate effects
Master Agreement on Apportionment (Alberta's commitments to Saskatchewan)	• The terms of the *Apportionment Agreement* will be respected
First Nation Rights and Traditional Uses	• Government of Alberta First Nation consultation policies and guidelines on Land Management and Resource Development. • Agreements with First Nations.
The *Water Act* (82)(5)(c)(iv) also provides that the Director may consider any other matters applicable to the transfer of the allocation that the Director considers relevant.	

Table 2 Matters and Factors that must be considered in making decisions on applications for licences, preliminary certificates or approvals affecting surface water in the SSRB

Matters and Factors	Guidelines
Existing, potential and cumulative effects on the aquatic environment	• No significant adverse effect on the aquatic environment
Existing, potential and cumulative effects on any applicable instream objective and/or Water Conservation Objective	• No significant adverse effect on existing instream objectives and/or Water Conservation Objectives
Efficiency of use	• Industry standards and best practices
Net diversion	• Likely an amendment • Existing allocation does not increase • Quality and timing of return flow should be benign or beneficial for environment
Existing, potential, and cumulative hydraulic, hydrological and hydrogeological effects	• No significant adverse effect
With respect to irrigation, the suitability of the land for irrigated agriculture	• The land must be suitable for irrigated agriculture: Class 4 or better in accordance with the standards of Alberta Agriculture, Food and Rural Development
Existing, potential, and cumulative effects on the operation of reservoirs or other water infrastructure	• No significant adverse effect on operations unless the reservoir or infrastructure licensee agrees it is feasible to adjust operations to mitigate effects
First Nation Rights and Traditional Uses	• Government of Alberta First Nation Consultation Policies and guidelines on Land Management and Resource Development. • Agreements with First Nations.

2.8 Water Management Strategies

AENV and water users will pursue broad water management strategies to ensure water availability for economic development and the aquatic environment in the SSRB.

2.8.1 Water Demand and Consumption

It is recommended that improvements in water management and administration of allocations be pursued by Alberta Environment through activities such as:

- Tracking actual water use;
- Upgrading computer modeling capabilities; and
- Exploring innovations and improvements in water licensing and legislation in order to better match allocations with needs. Return Flow Compensation is a pilot example demonstrating that a WCO may be exceeded, provided a certain volume of water, with an acceptable quality and timing to safeguard the aquatic environment and allow downstream reuse, is returned to the source. A continuous return is the most beneficial.

AENV supports the development of water markets and transfers to accommodate the re-distribution of water already allocated in the SSRB, and encourages improvements in water conservation methods throughout the basin.

2.8.2 Improved Dam Management to Protect The Aquatic Environment

Major on-stream dams and reservoirs owned and operated by the Alberta Government are typically managed to safely pass flows resulting from significant precipitation and snow melting events that occur upstream. Flow releases are in accordance with flood operating procedures to protect the integrity of the dam while minimizing the impacts of downstream high flows on infrastructure and public safety. After the inflows to the reservoir have peaked, releases are reduced in a staged manner, to return the reservoir to its target level for that time of year. During this time, there may be opportunities to manage flows for the benefit of the aquatic and riparian environment. These opportunities depend on many things, including the time of year, reservoir storage levels, the magnitude of releases, and biological benefits.

It appears that minor changes in dam operating practices could have more implications to the aquatic environment than transfers or holdbacks. For example, judicious flow reduction after a high flow event could greatly benefit replenishment of cottonwood poplar trees, under the right conditions.

It is also recommended that AENV hold discussions with Government and other dam owners to investigate opportunities to optimize operation of the facilities, to benefit water supply and the aquatic and riparian environment.

2.8.3 Protection and Management of Riparian Vegetation

Protection and management of riparian vegetation requires suitable water and land management. It is recommended that AENV complete Aquatic and Riparian Condition Assessments (ARCA) for the mainstream rivers of the SSRB, to assist with our understanding of the the river and help protect and manage riparian vegetation. While land management is outside AENV jurisdiction, AENV will work in partnership with the WPACs to prepare watershed management plans to encourage healthy riparian environments.

2.8.4 Flow Restoration in the Bow, Oldman, and South Saskatchewan River Sub-basins

To promote flow restoration in these rivers, the following actions are recommended:

- Licence holders be encouraged to take voluntary flow restoration actions, particularly during critical periods.
- Discussions be held with senior priority licence holders regarding voluntary restrictions to prevent withdrawals of restored flows.
- Research be conducted to determine how flow restoration benefits the aquatic environment.
- Operating licences for government dams and WCO conditions on diversion licences be assessed, if measurable amounts of restored flows are licensed. This will ensure the increased instream flow remains in the river, subject to priorities.

2.8.5 Water Quality

Water quality should be studied in more detail throughout the SSRB to assess land use impacts and develop beneficial management practices that mitigate these impacts. This will support further decision-making on sustaining growth and managing the rivers to enhance aquatic life.

2.8.6 Maintenance of the Red Deer River Sub-basin's Aquatic Environment

The Red Deer River's aquatic environment is a research priority, as it is hydrologically the healthiest of the SSRB Rivers. It is recommended that research focus on monitoring the impacts of additional water allocations on the aquatic environment and the riparian zone and that additional monitoring and study be carried out on the minimum flows required for waste assimilation. Depending on the research results, the WCO may be adjusted to minimize or prevent unacceptable impacts. If monitoring reveals potential problems, adaptive management principles may be applied by WPACs. For example, if it is determined that 16 cms winter minimum flow is no longer required to meet water quality requirements, consideration could be given to storing the surplus water in Glennifer Reservoir, to supplement flows for the benefit of the aquatic environment.

2.9 Suggested Changes to the *Water Act*

The following are possible amendments to the *Water Act* for which there is public support or which were suggested as a result of insights during work on this plan. Inclusion of these suggestions in this plan does not imply that the legislature will make any of these amendments.

- Allow private parties to hold licences for Water Conservation Objectives when obtained under the transfer provisions of the *Water Act*. Currently, the *Water Act* specifies that only the government may apply for and hold a licence for a water conservation objective. If this amendment is made, there should also be provision that if a WCO licence is transferred from one party to another (including the government) the purpose may not be changed.
- Allow a part of a licence to be cancelled. The present *Water Act* only permits cancellation of a full allocation. This is an obstacle to the desired objective of being able to match actual water needs with allocations.
- Allow water that becomes unallocated in the future to become part of an existing Crown Reservation. This will permit the water to become part of the Crown Reservation for uses deemed to be of greatest benefit to society. Presently the *Water Act* permits only water which is "currently unallocated" to become part of a Crown Reservation.

3. Additional Provisions

3.1 Future Watershed Management Planning Priorities

Watershed Planning and Advisory Councils (WPACs) are encouraged to consider the priorities in their watersheds and undertake future watershed management planning with this water management plan serving as a foundation. The Recommendations Report of the Basin Advisory Committees and *Water for Life: Alberta's Strategy for Sustainability* recommend a number of priorities, including holistic watershed management, performance indicators, land uses, economic planning, water conservation, water quality, groundwater, objectives for aquatic environments and evaluation of infrastructure needs (e.g. storage). Alberta Environment will assist the Watershed Planning and Advisory Councils in evaluations of the potential for on-stream and off-stream storage.

It is also recommended that adjustments to this plan be made, as research results on the potential water management implications of climate change are better understood.

3.2 Performance Monitoring Requirements

In partnership with the WPACs, it is recommended that performance monitoring of the aquatic environment be conducted, to support any refinements to the WCO and allocation recommendations, including the following:

- Flow monitoring to confirm water modelling results and adherence to designated WCOs.
- Tracking and reporting of actual water diversions and consumption.
- Water quality monitoring, particularly for dissolved oxygen and temperature, to confirm modelling results, and to help ensure protection of the aquatic environment. Additional parameters such as nutrients and pesticides could be monitored using the Long-term River Network program and targeted water quality initiatives.
- Assessment of biological communities, particularly fish populations and riparian forests.

3.3 Review of the Plan

This plan is the senior plan within the SSRB and all other water management plans in the SSRB must be consistent with it. However, it is recognized that improvements to this plan may be made as research results and other data become available. Section 12 of the *Water Act* describes the legal process for plan revisions.

Future watershed planning will be led by the Watershed Planning and Advisory Councils. The Councils will work together to ensure their individual planning is aligned with the SSRB Plan. Together they will decide when sufficient new information has been obtained or situations have sufficiently changed to warrant review of any aspect of the SSRB plan.

3.4 Implementation Responsibilities

Implementation of the plan encompasses both actions that are the legislated responsibility of Alberta Environment and actions that are best implemented through cooperation of partners.

3.4.1 The following are the legislated responsibility of Alberta Environment:

- Decisions to stop accepting applications for allocations of water for a period of time in the Bow, Oldman and South Saskatchewan River Sub-basins.
- Establishment of a Crown Reservation of water for the Bow, Oldman and South Saskatchewan River Sub-basins.
- Establishment of water conservation objectives.
- Repeal of the *South Saskatchewan Basin Water Allocation Regulation*.
- Improvements in water administration and legislation.
- Adjustments in dam management to benefit the aquatic environment.
- Completion of the Aquatic and Riparian Condition Assessment (ARCA).
- Amendments to the *Water Act*.
- Decision to temporarily stop accepting applications for allocations in the Red Deer River Sub-basin, when allocations reach 550,000 cubic decametres.
- Establishment of a future Crown Reservation for the Red Deer River Basin.

3.4.2 The following are the potential responsibility of Partnerships:

- Establishment of an Interbasin Water Coordinating Committee.
- Preparation of apportionment operations plan.

- Discussions with licence holders on voluntary reductions in diversions.
- Development and implementation of a research and monitoring plan.
- Development of water markets.
- Protection and management of riparian zones.
- Education and awareness.
- Future determination of the limit for allocations in the Red Deer River Sub-basin, once allocations reach 550,000 cubic decametres.
- Evaluation, as part of the watershed planning process, of water management infrastructure needs.
- Future watershed planning priorities.

4. References

Information on the SSRB Water Management Plan and the background studies may be found at: www3.gov.ab.ca/env/water/regions/ssrb/index.asp

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5. Glossary

AENV ~ Alberta Environment

Allocation ~ The volume, rate and timing of a diversion of water. When water is diverted for a use other than for household purposes (use by an owner of property adjacent to a water body or from an aquifer), it is referred to as an allocation. All water users (except for household users) apply to Alberta Environment for a licence to use a set allocation of water.

Apportionment ~ (see *Master Agreement on Apportionment*)

Approval ~ Under the *Water Act*, an approval provides authority for constructing works or for undertaking an activity within a water body. The approval includes conditions under which the activity may take place.

Aquatic Environment ~ (As defined in Alberta's *Water Act)* The components of the earth related to, living in or located in or on water or the beds or shores of a water body, including but not limited to all organic and inorganic matter, and living organisms and their habitat, including fish habitat, and their interacting natural systems.

BAC / Basin Advisory Committee ~ Established in each of the four sub-basins of the South Saskatchewan River Basin to provide advice for the SSRB Water Management Plan. Members of the BACs represented all sectors interested in water management in the sub-basin. Each sector selected its own representatives on the BAC. Typical sectors represented in a BAC include irrigation agriculture, non-irrigation agriculture, ecosystem protection/environmental, First Nations, industry, municipal and recreation.

cms ~ cubic metres per second

Condition on Licences ~ The terms of the licence that must be followed.

Crown Reservation ~ Section 35(1) of the Water Act states that "the Minister may by order reserve water that is not currently allocated under a licence or registration or specified in a preliminary certificate

(a) in order to determine how the water should be used, or
(b) for any other purpose."

dam^3 ~ decametres cubed (1,000 cubic metres). 1 dam^3 = 0.81 acre feet.

Director ~ For purposes of administration of the *Water Act*, certain staff in Alberta Environment, such as Approvals Managers, are designated as "Directors". Under the *Water Act* a Director has sole authority to make decisions concerning a number of specified subjects, e.g., transfers, holdbacks and establishing WCOs.

Dissolved Oxygen ~ Amount of available oxygen contained in the water, but not including the oxygen that is part of the water molecule (H_2O). Expressed as milligrams per litre.

Groundwater ~ Water located beneath the ground surface in soil pore spaces and in the fractures of geologic formations. A formation of rock/soil is called an aquifer when it can yield a useable quantity of water. Groundwater that is in an aquifer that readily (drawdown cone for a

well intersects a surface water body) flows naturally under the ground to surface water bodies is considered surface water for licencing purposes in Alberta.

Instream Flow ~ The rate of flow in a river, without reference to its purpose.

Instream Needs / Instream Flow Needs (IFN) ~ This is the scientifically determined amount of water, flow rate, water level, or water quality that is required in a river or other body of water to sustain a healthy aquatic environment or to meet human needs such as recreation, navigation, waste assimilation, or aesthetics.

Instream Objectives ~ Regulated flows that should remain in the river via dam operations or as a restriction on licences. Below dams, Instream Objectives are in place in throughout the SSRB, although some offer only limited protection of the aquatic environment. Instream Objectives have usually been set in response to fish habitat instream needs (the Fish Rule Curve) and/or water quality.

Irrigation District ~ An organization that owns and manages a water delivery system for irrigation for a given region. In Alberta, there are 13 irrigation districts. Some districts convey water for other purposes, such as municipal use and stockwatering.

Licence In Good Standing ~ This term is used in Alberta's *Water Act*, but is not defined. One of the issues that must be determined by the Director is whether or not the allocation of water to be transferred is held "under a licence in good standing" (*Water Act*, s. 81(7)(c)). The licence has to be in good standing at the time the Director considers the application (that is, it already exists in good standing or the licence holder brings the licence into good standing prior to the time when the Director considers the application to transfer.) Examples of a licence not in "good standing" are a licence that is:

- In breach of the *Water Act*
- Subject to an investigation under the *Water Act*
- Subject to an enforcement tool or prosecution
- In breach of terms and conditions of the licence
- In non-compliance with the terms and conditions of the licence (e.g. did not build the diversion site within the specified period)

Master Agreement on Apportionment ~ Schedule A of the 1969 *Master Agreement on Apportionment* for the South Saskatchewan River between Alberta and Saskatchewan allows Alberta to "divert, store or consume" from the river system each year, a volume of water equal to one-half of the apportionable flow of the South Saskatchewan River at the Alberta-Saskatchewan boundary. The remaining volume of flow must be allowed to pass downstream into Saskatchewan. The exception to this general rule is that Alberta is entitled to divert, store or consume a minimum of 2.1 million-acre feet in any year. The effect of this exception is that during years when the volume of natural flow is less than 4.2 million-acre feet (a rare occurrence), Alberta may pass less than one-half of the apportionable flow to Saskatchewan. If at any time during a year Alberta wants to divert, store or consume more than half the apportionable flow, a flow rate of 1,500 cubic feet per second (cfs) must be maintained at the Saskatchewan border, unless the natural flow is less than 3,000 cfs, in which case half the natural flow must be passed. *(There is no policy in Alberta as to the amount of water each sub-basin of the SSRB must contribute to the Saskatchewan apportionment.)*

Natural Flow / Natural Rate of Flow ~ Natural flow is the flow in rivers that would have occurred in the absence of any man-made effects on, or regulation of, flow. For purposes of water management, natural flow is a calculated value based on the recorded flows of contributing rivers; a number of factors concerning the river reaches (e.g. evaporation, channel losses, etc.); and water diversions. This is also known as "re-constructed flow" and "naturalized flow".

Net Diversion ~ A licence that allows the licencee to receive credit for returning water to the source of the diversion. The water must be of a reasonable quality and be returned with suitable timing. The credit permits increased diversion equivalent to the volume returned, provided the net diversion does not exceed the total licence allocation.

Preliminary Certificates ~ An authorization issued by the Director to certify that a licence will be issued if certain conditions are met.

Retrofit Provision ~ Water licences issued in recent years contain a condition indicating that once a water conservation objective is established, the licence may be amended to include the WCO. The licence holder would then not be permitted to withdraw water when river flow is less than the objective.

Riparian Area ~ The area along streams, lakes, and wetlands where water and land interact. These areas support plants and animals, and protect aquatic environments by filtering out sediments and nutrients originating from upland areas.

Riparian Vegetation ~ The vegetation that exists in riparian areas and is supported by the interaction of the water and land.

River Basin ~ An area of land drained by a river and its associated streams or tributaries. Alberta's *Water Act* identifies seven major river basins within the province:

- Peace/Slave River Basin
- Athabasca River Basin
- North Saskatchewan River Basin
- South Saskatchewan River Basin
- Milk River Basin
- Beaver River Basin
- Hay River Basin

SSRB ~ South Saskatchewan River Basin. The South Saskatchewan River Basin includes the sub-basins of the Red Deer River, Bow River, and Oldman River (including the South Saskatchewan).

Southern Tributaries ~ This term refers to the St. Mary, Belly and Waterton rivers, which are also collectively referred to as the southern tributaries of the Oldman River.

Sub-basin ~ A part of a river basin drained by a tributary or having characteristics that are significantly different from other areas in the basin.

Surface Water ~ Water bodies such as lakes, ponds, wetlands, rivers, and streams. It may also refer to sub-surface water or groundwater with a direct and immediate hydrological connection to surface water (for example, water in a well beside a river).

Voluntary Action ~ Performing an activity freely, without compulsion.

WCO ~ Water Conservation Objective

WPAC ~ Watershed Planning and Advisory Council (see *Water for Life: Alberta's Strategy for Sustainability*). In the SSRB (at the time of writing this plan), WPACs include the Bow River Basin Council, the Oldman Watershed Council, and the Red Deer River Watershed Alliance.

Water Act ~ The purpose of Alberta's *Water Act* is to support and promote the conservation and management of water, including the wise allocation and use of water (s.2).

Water Allocation Transfer ~ A water allocation transfer occurs when the holder of an existing water licence agrees to sell all or part of the amount they are allocated to another person or organization. Alberta Environment must approve a transfer. When this occurs, the allocation is separated from the original land, and a new licence, with the seniority of the transferred allocation, is issued and attached to the new location. Under the *Water Act*, Alberta Environment may place conditions on the new licence. Water allocation transfers may occur only if authorized under an approved water management plan, or by the Lieutenant Governor in Council. See Sections 81,82 and 83 of the *Water Act.*

Water Conservation Holdback ~ If the Director is of the opinion that withholding water is in the public interest to protect the aquatic environment or to implement a Water Conservation Objective, and the ability to withhold water has been authorized in an applicable approved water management plan or by order of the Lieutenant Governor in Council, the Director may withhold up to 10% of an allocation of water under a licence that is being transferred. The withholding occurs at the time the new licence created for the transferred allocation is issued (section 82(2) of the *Water Act*).

Water Conservation Objective (WCO) ~ As defined in Alberta's *Water Act*, a Water Conservation Objective is the amount and quality of water necessary for the protection of a natural water body or its aquatic environment. It may also include water necessary to maintain a rate of flow or water level requirements.

From the *Water Act*: *"Water Conservation Objective" means the amount and quality of water established by the Director under Part 2, based on information available to the Director, to be necessary for the*

(i) protection of a natural water body or its aquatic environment, or any part of it;
(ii) protection of tourism, recreational, transportation or waste assimilation uses of water; or
(iii) management of fish or wildlife, and may include water necessary for the rate of flow of water or water level requirements.

A licence may be issued by the Director to the Government of Alberta for the purpose of implementing a Water Conservation Objective.

Water Licence ~ A water licence provides the authority for diverting and using surface water or groundwater allocation. The licence identifies the water source, the location of the diversion site, an amount of water to be diverted and used from that source, the priority of the "water right" established by the licence, and the condition under which the diversion and use must take place.

Water Management Plan ~ Alberta's *Water Act* and *Framework for Water Management Planning* outlines the process for water management planning and the components required for water management plans in the province.

Water Use Efficiency ~ To use the least possible water to accomplish an objective, such as growing a crop.

Water Use Effectiveness ~ To use water for purposes that provide the maximum desired benefits for society.

Watershed ~ An area of land that catches precipitation and drains into a body of water, such as a marsh, stream, river or lake.

Appendices

Appendix A
Public Consultation Process

Phase One

Basin Advisory Committees (BACs) were formed in late 2000 and early 2001. Municipalities, Treaty #7 First Nations, major water-using industries, recreation groups with an interest in water, fish and game clubs, environmental organizations, irrigation districts, and agricultural organizations in the SSRB were invited to send representatives. After initial organizational meetings, the basic structure of the BACs was created.

In 2001, a number of the BACs held sessions to familiarize members with water management and relevant issues in the SSRB. That same year, Alberta Environment (AENV) decided to carry out the planning in phases. The primary purpose of Phase One was to seek public views on the authorization of water allocation transfers, water conservation holdbacks, and the question of whether applications for new allocations in the basins of the St. Mary, Belly, and Waterton rivers should be accepted.

Phase One commenced in October 2001. AENV held several meetings with each BAC, and in plenary, to discuss the above matters. Based on these discussions a draft plan was prepared.

During January 2002, public meetings to receive comments on the draft plan were held in Red Deer, Drumheller, Bindloss, Calgary, Brooks, Medicine Hat, and Lethbridge.

Although some people were concerned about the development of a market for water, the public was broadly supportive of authorizing the use of water allocation transfers and water conservation holdbacks in the SSRB.

On the question of whether AENV should accept applications for new allocations in the basins of the St. Mary, Belly, and Waterton rivers, there was some difference of opinion. Some members of the public felt that AENV should continue to issue licences indefinitely, viewing a high-risk licence as a private business decision. However, most members of the public were in agreement with a set allocation volume, recognizing that an unlimited number of licences would have adverse impacts on the aquatic environment, as well as present administrative difficulties.

The comments were documented and then considered in preparation of the final draft plan. In June 2002, the provincial cabinet approved the draft, which became the first Approved Water Management Plan in Alberta under the new *Water Act*.

Phase Two

During the final months of Phase One, discussions began on Phase Two. Over a one-year period, background studies for the project were prepared. In June 2003, the studies were completed and a booklet summarizing the work was prepared and provided to the BACs and others. The BACs reviewed the studies during the summer of 2003.

In September of 2003, AENV retained Equus Consulting Group (Bill McMillan) to help the BACs develop recommendations for the draft water management plan. During the next few months, each BAC met with Mr. McMillan on several occasions to hear presentations on the background

studies and to consider possible recommendations. At Mr. McMillan's suggestion, the BACs appointed Chairs and Vice-chairs. On a number of occasions, the Chairs had discussions with Mr. McMillan, which helped them understand the differing perspectives of each BAC. In July 2004, the BACs submitted a report on their recommendations to the Steering Committee for the planning project. These recommendations formed the foundation for the water management plan.

During Phase Two, Alberta Environment also held a number of meetings with the Treaty #7 First Nations in April and May 2005. General concerns identified during these meetings were considered in preparation of the draft water management plan. Following release of the draft plan, the consulting firm Gartner Lee was retained to provide technical information on the draft plan to First Nations. Gartner Lee worked with potentially affected First Nations to assist in analyzing the plan and to document their concerns about it.

The Equus Consulting Group was retained again in July 2005 to conduct public consultations on the draft water management plan. A response form was prepared for completion on-line on the Equus website or on paper. The draft plan was released to the public, along with a package of supporting documentation, in mid-October 2005. Numerous stakeholders received letters advising of its release. In late-November and early December, public open houses and meetings were held in seven locations: Medicine Hat, Bindloss, Brooks, Calgary, Drumheller, Red Deer and Lethbridge. Mr. McMillan facilitated the public meetings and an Equus employee typed the public comments on a laptop. The deadline for public input in the form of response forms, letters and briefs was originally December 9, 2005, but this was extended to January 13, 2006. Equus then prepared a summary and analysis of all public input. This report was considered by the Steering Committee in preparing the final plan.

In February and March 2006, the Red Deer River Municipal Users Group and the Steering Committee held discussions on specific concerns with the draft plan. These led to revised recommendations satisfactory to both parties.

Appendix B
The Basin Advisory Committees

BOW RIVER BAC	Sector	Specific Affiliation
Steve Meadows, Chair	General Public	
Lori Brewer-Lawe	General Public	
Gloria Wilkinson	General Public	
Bert van Duin	Industry	Westhoff Engineering Resources Inc.
Gord MacMahon	Industry	APF Energy / Trees Alive Alberta
Chantelle Cardinal	First Nations	First Nations Technical Services Advisory Group
Annette Lonechild	First Nations	Stoney First Nation
Cedric Solway	First Nations	Siksika First Nation
Norm Carlson	Health Authorities	Calgary Health Region
Roger Drury	Water Power	TransAlta Utilities Corporation
Paul Fesko	Urban Municipal	City of Calgary
Melanie Cook	Urban Municipal	City of Calgary
Yin Deong	Urban Municipal	City of Calgary
Judy Stewart	Urban Municipal	City of Cochrane
Neil Hollands	Urban Municipal	Town of Brooks
Hugh Pepper	Rural Municipal	M.D. of Bighorn No. 8
Vince Fabian	Rural Municipal	County of Newell No. 4
Dr. Derald Smith	Academia	University of Calgary
Gary Kindrat	Ecosystem Protection	Ducks Unlimited
Chris Manderson	Ecosystem Protection	City of Calgary
Heinz Unger, Vice-chair	Ecosystem Protection	Alberta Wilderness Association
Bonnie Kleinmark	Ecosystem Protection	River Valley Committee, Parks Calgary Foundation
Mona Keffer	Fisheries	Alberta Wilderness Association
Richard Phillips, Vice-chair	Irrigation	Bow River Irrigation District
Jim Webber	Irrigation	Western Irrigation District
Earl Wilson	Irrigation	Eastern Irrigation District
Chris Vermeeren	Ranching/Stock Watering	County of Newell No. 4
Robert Everett	Recreation	Sarcee Fish & Game Association
Sheena Majewski	Observer	Dept. of Fisheries and Oceans Canada
Mark Bennett	BRBC Liaison	Bow River Basin Council
Mike Murray	BRBC Liaison	Bow River Basin Council

OLDMAN RIVER BAC	Sector	Specific Affiliation
Duncan Lloyd, Chair	Urban Municipal	Town of Coaldale
Barbara Lacey, Vice-chair	Urban Municipal	City of Lethbridge
Doug Kaupp	Urban Municipal	City of Lethbridge
Garth Bekkering	Urban Municipal	Town of Taber
Ralph Bourque, Vice-Chair	Urban Municipal	Town of Pincher Creek
Brian Hammond	Rural Municipal	M.D. of Pincher Creek
Hank Van Beers	Rural Municipal	M.D. of Taber
Cecil Wiest	Rural Municipal	M.D. of Taber
Greg Nikles	Industry	Rogers Sugar Ltd.
Ron Renwick	Irrigation	St. Mary River Irrigation District
Kevin Haggart	Irrigation	Lethbridge Northern Irrigation District
Larry Nolan	Agriculture (other water users)	
Jim Clarke	Recreation	Lethbridge Fish & Game Association (affiliated with Alberta Fish & Game Association)
Cheryl Bradley	Ecosystem Protection	Southern Alberta Environmental Group
Cheryl Fujikawa	Ecosystem Protection	Southern Alberta Environmental Group
Gary Kindrat	Ecosystem Protection	Ducks Unlimited
Henry Bosman		Oldman Dam Environmental Advisory Committee
Andrew Hurly		Oldman Dam Environmental Advisory committee

RED DEER RIVER BAC	Sector	Specific Affiliation
Al Kennedy, Chair	Industry	Nova Chemicals
Gordon Musgrove	Rural Municipal	County of Newell No. 4
Dug Major	Rural Municipal	Special Areas
Art Grenville	Rural Municipal	Starland County
Ian Harvie	Rural Municipal	Mountain View County
Allison Williams	Rural Municipal	Mountain View County
Ken Van Dewark	Rural Municipal	Red Deer County
John Van Doesburg	Rural Municipal	Mountain view County
Douglas Fleming	Municipal	Palliser Regional Municipal Services
Bill Shaw	Urban Municipal	Represented 23 towns, villages and the City of Red Deer
Myrna Bauman	Urban Municipal	Town of Three Hills
Greg Conn	Agriculture	Alberta Beef Producers
Jack Swainson	Agriculture	Alberta Conservation Tillage Society
Colin Kure	Upstream Recreation	Alberta Fish and Game Association
Jill Dyck	Downstream Recreation	Alberta Fish and Game Association
Margaret Coutts, Vice-chair	Ecosystem Protection	Red Deer River Naturalists
Tracy Scott	Ecosystem Protection	Ducks Unlimited
Todd McBride	Tourism	

SOUTH SASKATCHEWAN RIVER SUB-BASIN BAC	Sector	Specific Affiliation
Frank Wetsch, Chair	Urban Municipal	City of Medicine Hat
Grayson Mauch, Vice-chair	Urban Municipal	City of Medicine Hat
Floyd Haas	Rural Municipal and Agriculture (other water users)	Cypress County
Ron Wendling	Industry	Canadian Fertilizers Ltd.
Jim French	Industry	Canadian Fertilizers Ltd.
Corlaine Gardner	Environmental	Grassland Naturalists
Duncan Baldie	Recreation	Medicine Hat Fish & Game Association
Ralph Pinder	Recreation	Redcliff Anglers
Gary Bierback	Irrigation	St. Mary River Irrigation District

Appendix C
Relationship of the Water Management Plan to Other Planning Initiatives

In general, water management plans should "provide broad guidance for water management, set out clear and strategic directions regarding how water should be managed or result in specific actions" (*Framework for Water Management Planning*, p.13). The success of the SSRB water management plan will depend, in part, on an understanding of the many other commitments and initiatives that affect how water is used and managed in southern Alberta.

This appendix contains a description of the main planning initiatives believed to have some connection to water use and conservation in the SSRB, along with some examples of how the initiatives interrelate with the water management plan. Not all local watershed initiatives are specifically identified in this appendix. A list of the agencies generally involved in or supporting these initiatives is provided.

Provincial Initiatives

- *Water for Life: Alberta's Strategy for Sustainability*

  The Alberta Government has adopted a new approach to water management through *Water for Life: Alberta's Strategy for Sustainability*. *Water for Life* outlines key directions and priorities to guide future water management in Alberta.

  Water for Life is based on the following commitments to Albertans:
  - Albertans are assured their drinking water is safe.
  - Albertans are assured that the province's aquatic environments are maintained and protected.
  - Albertans are assured that water is managed effectively to support sustainable economic development.

  The SSRB Water Management Plan will help achieve *Water for Life's* goal of protecting aquatic environments, while supporting sustainable development.

  The *Water for Life* strategy also contains the following medium-term (2007-10) and long-term (2010-14) outcomes:
  - Water management objectives and priorities for sustaining aquatic environments are established through watershed plans.
  - Water is managed and allocated to sustain aquatic environments and to ensure their contribution to Alberta's natural capital and quality of life are maintained.
  - Water management objectives and priorities to support sustainable economic development are established through watershed plans.
  - By 2015, improvement by 30%, from 2005 levels, of the overall efficiency and productivity of water use in Alberta (firm targets to be determined by the Provincial Water Advisory Council).

  While the Government of Alberta, led by Alberta Environment, will remain accountable and will continue to oversee water and watershed management activities in the province, *Water for Life* identifies three types of partnerships integral to achieving stewardship of our water resources:

- A Provincial Water Advisory Council;
- Watershed Planning and Advisory Councils (WPACs); and
- Watershed Stewardship Groups (WSGs).

- *Government of Alberta's First Nation Consultation Policy on Land Management and Resource Development*

  The Government of Alberta is responsible for managing the development of its natural resources for the benefit of all Albertans. Alberta acknowledges that the existing treaty rights of the Aboriginal peoples of Canada are recognized and affirmed by Section 35 of the *Constitution Act* (1982).

  Alberta will consult with First Nations where land management and resource development on provincial Crown land may infringe First Nation rights and traditional uses.

- *Sustainable Resource and Environmental Management (SREM)*

  The SREM framework is designed to focus provincial government departments on delivering environmental outcomes through integrated policy making and performance measurement. SREM involves a tiered approach to achieving environmental outcomes (see Table below) and recognizes that environmental quality can be achieved only if the cumulative effects of economic development are effectively managed through long-term integrated actions. Assessment of the implications of economic development and growth strategies will assist with making appropriate decisions and achieving desired environmental outcomes.

SREM Tier	**Initiatives to Establish Environmental Outcomes**
Provincial Scale: Vision & Mission	Government of Alberta and federal business plans; Water for Life; Alberta Agriculture Growth Strategy; Economic Development Strategy; Canada and Alberta Biodiversity Strategies; Alberta Land Use Strategy; Municipal policies
Regional Scale: Priorities	Southern Alberta Sustainability Strategy (SASS), Eastern Slopes Policy
Sub-regional Scale: Objectives	Water Management Plans; Airshed Management Plans; Integrated Land Management/Integrated Resource Planning Policies; Access Management Plans; Municipal Area Structure Plans; Species at Risk; Recovery Plans; Energy development guidelines specific to grasslands; Inter-Municipal Regional Partnership Strategies
Local Scale: Results	Regulatory approvals; Environmental Impact Assessment decisions; Local plans: parks, subdivisions, logging etc.; Stormwater guidelines for streams; Total loading limits for streams; Local Cows & Fish initiatives; Environmental Farm Plans

Regional Initiatives

- *Southern Alberta Sustainability Strategy (SASS)*

  The Southern Alberta Sustainability Strategy will define societal consensus for the desired resource and environmental outcomes for southern Alberta landscapes. The outcomes are described as the desired, achievable, strategic, long-term, integrated, end-state goals, or "integrated priorities."

  To do this, SASS will analyze the human influences on the environment of southern Alberta in a single exercise, rather than dealing with issues in isolation. It will identify and prioritize the environmental assets that need to be protected and the issues that need to be addressed. Decisions will be based on an analysis of the current state of the environment and strategic trends for the future. It will be delivered through a partnership based decision-making process that engages both stakeholders and the general public to make decisions for the best possible future for southern Alberta. The strategy will provide the framework to allow for the development of concrete tools and actions to achieve and sustain a desired level of environmental quality on southern Alberta's diverse landscapes.

- *South Saskatchewan River Basin (SSRB) in general*

  The following lists describe management plans in place in the SSRB, along with projects and initiatives that have implications for water management. Where appropriate, lead government departments are identified.

- *Local watershed initiatives in smaller basins (in place or under development)*
  - A number of local watershed protection groups/initiatives are currently active in the SSRB. These local initiatives may take many forms but are often characterized by private landowners working in partnership with local municipalities and other agencies, such as:
    - Agriculture and Agri-Food Canada, Prairie Farm Rehabilitation Administration (PFRA)
    - Ducks Unlimited Canada
    - Alberta Agriculture, Food and Rural Development (AAFRD)
    - Department of Fisheries and Oceans (DFO)
    - Alberta Conservation Association (ACA)
    - Cows and Fish, Alberta Riparian Habitat Management Program
    - Community Riparian Program under the Agriculture and Food Council.
  - The focus of these initiatives is generally water quality and land use. These local groups are key to achieving long-term sustainable watershed management. Examples are noted for each sub-basin.

- *Integrated Resource Plans, Forest Management Plans*
  - Lead: Alberta Sustainable Resource Development
  - Purpose: There is generally one objective per plan (e.g., protection of watersheds)
  - Several plans are either in place or under development.

- *Municipal Development Plans*
  - Lead: Urban and rural municipalities

- Purpose: To guide development towards reducing negative impacts on the environment, including the water resource.
- Several plans are either in place or under development.

- *Management Plans for Parks and Protected Areas (National and Provincial)*
  - Lead: Parks Canada; Alberta Community Development
  - Purpose:
    - Parks Canada ~ As a strategic and long-term guide, a management plan establishes a vision looking 15 or more years into the future. Its primary goal is to ensure there is a clearly defined direction for the maintenance or restoration of ecological integrity and, in the light of this primary goal, for guiding appropriate use. Management plans outline how our natural heritage will be preserved in each park and protected area.
    - Alberta Community Development ~ Management plans describe the type and extent of outdoor recreation and tourism opportunities, facilities, and services that will be permitted. These plans have the inherent effect of watershed protection.
  - Several plans are either in place or are to be initiated.

- National Water Supply Expansion Program (NWSEP)
  - NWSEP is a four-year initiative under the Agricultural Policy Framework.
  - Purpose: To reduce the risk of future water shortages through the planning and development of secure, healthy, and reliable water resources.
  - Project tiers include smaller-scale water development projects; larger-scale infrastructure projects (such as regional water pipelines); and strategic initiatives such as studies, planning activities, and/or undertakings that increase the knowledge base of the water resource.
  - In total, the Government of Canada is providing $12.5 million, until March 31, 2008, for projects in Alberta.

<u>Bow River Basin</u>

- *The Bow River Basin Council (BRBC)*
  - The BRBC is a multi-stakeholder, charitable organization dedicated to the improvement and protection of the Bow River Basin, considering:
    - Riparian zones,
    - Aquatic environments,
    - Quality and quantity of water, and
    - Effects of land use on surface and groundwater.
  - The BRBC currently has approximately 140 members.
  - The Bow Basin Advisory Council (BAC) is one of four basin advisory groups asked to develop recommendations for the SSRB plan. The BAC in the Bow River Basin is a sub-committee of the BRBC.
  - The BRBC released its *2005 Report on the State of the Bow River Basin* on April 29, 2005.

- *Bow Basin Watershed Management Plan*
  - Lead: The Bow River Basin Council
  - Purpose: The Bow River Basin Council is currently working on the development of a Watershed Management Plan for the Bow Basin. Although it is anticipated the first phase of the plan will largely focus on aspects of surface water quality, other

interconnected topics such as land-use, groundwater, and water quantity will be considered as they relate to water quality. This planning project is in the early stages, with draft project terms of reference to be developed as one of the first steps.

- *Highwood Water Management Plan*
  - Lead: Alberta Environment
  - Purpose: Phase 1 of the Highwood Management Plan deals with matters directly relevant to the Highwood Diversion Plan and information requirements of the Natural Resources Conservation Board/Canadian Environmental Assessment Agency Joint Review Panel. Phase 2 will address other aspects of water management in the Highwood River Basin, including Water Conservation Objectives and the current moratorium on *Water Act* approvals in the basin. The overall goal is to achieve sustainable water management in the Highwood River, Little Bow River, and Mosquito Creek Sub-basins.
  - A Public Advisory Committee (PAC) was formed to advise on the development of the water management plan for the Highwood-Little Bow system.
  - Studies (e.g., Instream Flow Needs) conducted within this process have served as prototypes for other studies within the SSRB.

- *Nose Creek Water Management Plan*
  - Lead: The Nose Creek Partnership
  - Purpose: The Nose Creek Partnership is in the final stages of preparing a water management plan to help protect riparian areas and improve water quality in the Nose Creek watershed. The recommendations contained in the draft plan are intended to provide municipal, provincial, and federal jurisdictions with a consistent and cross-jurisdictional approach to managing natural resources within the watershed.

- *Little Bow River and Mosquito Creek Water Quality Protection Plan*
  - Lead: Alberta Environment
  - Purpose: To prepare a Water Quality Protection Plan that will outline the activities in the Little Bow River Basin necessary to achieving a fertility state of water quality in the reservoir equivalent to a clear lake.

- Elbow River Water Management Plan
  - Lead: The Elbow River Watershed Partnership.
  - Purpose. The Partnership was formed in response to a growing concern about the deteriorating water quality in the Elbow River, the increasing urbanization of the Elbow watershed, and concern about relying solely on the government to protect the watershed. The Partnership is preparing a water management plan to address stakeholder concerns.

- Ghost-Waiparous Access Management Plan
  - Lead: Alberta Sustainable Resource Development.
  - Purpose: To develop an access management plan intended to provide opportunities for recreational use in the Ghost-Waiparous area, while maintaining the area's natural resources.

- Other watershed initiatives in the Bow River Basin:
  - Crowfoot Creek Watershed Group,
  - Frank Lake Water Quality Mitigation Initiative,
  - Chestermere Lake Working Group,
  - Grand Valley Creek Partnership,
  - Calgary River Valleys Committee.

Red Deer River Basin

- *Red Deer River Watershed Alliance* (WPAC)
  - WPAC established late 2005
  - Goals:
    - To provide an inclusive forum for the exchange of information and collaborative dialogue for watershed protection, conservation and improvement.
    - To raise awareness on issues impacting the watershed.
    - To promote the use of beneficial management practices and the integrated management of land and water resources.
    - To foster the preservation and enhancement of the quality of water supplies and water systems in the watershed.
    - To champion the wise management of the quantity of water supplies in the watershed.
  - Current projects under development include a Watershed Stewardship Guide, a State of the Watershed Report and a Watershed Atlas.

- *Buffalo Lake Integrated Shoreland (under development)*
  - Co-Leads: SRD and AENV
  - Purpose: To develop an integrated resource management plan that directs and supports decision making by provincial regulators for the management and use of the defined shoreline right-of-way, so that the ecological integrity (and natural quality) of the Buffalo Lake Integrated Shoreland is maintained now and in the future.

- *Red Deer River Corridor Integrated Management Plan (in place)*
  - Lead: Alberta Environment, Alberta Sustainable Resource Development, Alberta Community Development, municipalities.
  - Purpose: The purpose of this integrated management plan is threefold:
    - To coordinate and integrate land and resource management in the corridor to provide long-term, integrated management direction;
    - To mitigate and resolve conflicts between resource uses and minimize impacts of resource uses on historic and natural resources; and
    - To promote sustainable development in the corridor.
  - The plan contains references to water management, river recreation, and fisheries.

- *Glennifer Lake Reservoir Shoreline Areas Structure Plan (in place)*
  - Lead: Alberta Environment, Alberta Community Development, municipalities.
  - Purpose: Contains policies for reservoir levels for recreation and affects water management for the Red Deer River downstream.

- *Special Areas Water Supply Project (proposed)*
  - Lead: The Special Areas Board (Alberta Municipal Affairs).
  - Purpose: The Board has submitted an application under the *Water Act* to divert and supply water to landowners and communities within the Special Areas.

- *Other watershed initiatives*
  - Little Red Deer River Watershed Initiative
  - Pine Lake Restoration Society

Oldman River Basin

- *Oldman Watershed Council*
  - The Oldman Watershed Council (OWC) was formed in September 2004, when the Oldman River Basin Water Quality Initiative merged with the Oldman Basin Advisory Council.
  - The OWC is currently working on a State of the Watershed (SOW) report, beginning with a literature search in partnership with the Alberta Ingenuity Centre. The SOW report will provide a broad overview of the health of the watershed, leading to the development of an integrated watershed management plan.
  - The OWC has more than 240 members.
  - The council focuses on five key areas:
    - Providing information and input into water management planning activities that reflect the needs of stakeholders in the Oldman Watershed.
    - Increasing awareness and understanding of the Oldman Watershed among residents and stakeholders and encouraging commitment and responsibility for water quality and water use.
    - Refining and expanding knowledge of water-related conditions and processes throughout the watershed.
    - Promoting sustainable land use practices that protect the watershed.
    - Reducing contaminants, such as microbes, nutrients and pesticides, which enter surface water and groundwater in the watershed.
  - Members include: Chinook Health Region; Alberta Agriculture, Food and Rural Development; Alberta Environment; Alberta Cattle Feeders' Association; Agriculture and Agri-Food Canada; Alberta Cattle Commission; Alberta Health; Alberta Irrigation Projects Association; Alberta Pork Producers; Canbra Foods; City of Lethbridge; County of Lethbridge; Health Canada; Oldman River Intermunicipal Service Agency; Prairie Farm Rehabilitation Administration; Southern Alberta Environmental Group; University of Lethbridge.

- *C5 Forest Management Plan (under development)*
  - Lead: Alberta Sustainable Resource Development
  - Purpose: The C5 Forest Management Plan's purposes are to:
    - Identify goals that define the preferred future forest, and the objectives and strategies (operational activities) required to manage the forest area on a sustainable forest management basis.
    - Recognize resource values, uses, and activities, including Aboriginal uses, on the landscape, within the framework of the Alberta Advantage.
    - Identify sustainable timber harvest levels (Annual Allowable Cut) for a period equivalent to two forest rotations.

- Provide the context for the development of Regional Timber Harvest Planning and Operating Ground Rules, to be produced by 2006.

- Objectives include reclamation and reducing impacts from forest harvesting and road building on the watershed.

- *Castle River Access Management Plan (under development)*
  - Lead: Alberta Sustainable Resource Development
  - Purpose: The purpose of this plan is to address and provide operational-level direction for the recreational use of on- and off-highway vehicles in the Castle River sub-region. The plan provides a mapped system of routes and trails specifically for that use. The plan may have the incidental benefit of reducing impacts on the watershed from erosion caused by off-road vehicle use.

- *Other watershed initiatives*
  - Beaver Creek Watershed Group
  - Pincher Creek Watershed Group

<u>South Saskatchewan River Sub-basin</u>

A Watershed Stewardship Group is being formed for the sub-basin.

Appendix D
Issues Not Considered in the SSRB Planning Process

A number of issues were outside the scope of the SSRB planning process. These issues included the following:

- Climate change
  Climate change was not considered due the absence of "high-confidence" research conclusions on future water supply and demand that may result from climate change. After the SSRB planning process began, a major climate change research initiative for the SSRB commenced. Results of this initiative are expected in 2006.

- Upstream reaches and tributaries to mainstem rivers
  The management of the main rivers downstream of major reservoirs is understood and able to be modeled with technology available to Alberta Environment. However, detailed analysis of the numerous tributaries was predicted to be difficult and was not attempted in this plan. It was assumed that the mainstem river analyses would provide sufficient information to predict effects in the other parts of the basin. As a result the plan focused on the mainstems of the Bow River (downstream of Bearspaw Reservoir), Oldman River (downstream of Oldman Reservoir) and Red Deer River (downstream of Glennifer Reservoir), as well as the South Saskatchewan River downstream of the confluence of the Bow and Oldman rivers. During preparation of the plan it was concluded that downstream WCOs would have a significant effect on headwaters and tributaries.

- Water storage
  Specific water storage infrastructure needs were not considered as a solution to water supply issues, as this issue would best be addressed on a case-by-case basis by the WPACs in their sub-basin watershed management planning initiatives.

- Forced reductions in allocations
  A premise of the SSRB water management planning process was that no licence would be cancelled for the sole reason of accomplishing recommended plan outcomes.

- Allocation needs
  Specific water needs in terms of an allocation for any water user or sector was not to be determined. The plan was designed to assess the state of the rivers in terms of their aquatic environment, given existing allocations and proposed projects. If the analysis showed an excess of water, then allocations for any purpose would be possible for that excess. There was no intent to figure out which stakeholders require water. Economics was presumed to dictate that. General predictions were made and models used all available information to predict impacts to the river.

- Administering Priority of Rights
  The principle of "first in time, first in right" is enshrined in the Water Act and it was supported in recent public consultations on the *Water for Life: Alberta's Strategy for Sustainability*. As a result, addressing priority of water allocations was not considered. However, many of the outcomes of the plan relate to priority and risk of receiving water.

- Point and non-point source pollution issues
  The quantity of water available and how existing contaminant loads affect aquatic health had to be addressed first. Following this plan, water quality issues are better addressed within smaller-scale watershed management plans. Water quality variables that were considered in this plan were those that are flow dependent (i.e., dissolved oxygen and temperature), as they affect fish and ammonia downstream of wastewater treatment plants. Other forms of pollution, such as metals and chemicals, are best controlled at the source.

- Number of households or dugouts per parcel
  This is a suitable topic for smaller scale watershed management plans. Ministerial Order 4/99 presently limits the number of households per parcel of land to three.

- Groundwater
  The planning process focused on surface water issues. Groundwater that is not hydraulically connected to surface water is not considered in this plan.

- Wildlife
  Fish, insects and other animals in the water are addressed in this report in the context of the aquatic environment. However, issues concerning wildlife in riparian areas are better addressed within smaller-scale watershed management plans.

Appendix E

Summary of the Information Assembled as Part of the Planning Process

This section describes the key information considered during the planning process, including a number of studies specifically prepared to support the process.

Legislation

- The *Water Act*
- *Water (Ministerial) Regulation* (Alberta Regulation 205/98).
- *South Saskatchewan Basin Water Allocation Regulation* (Alberta Regulation 307/1991):
  - This regulation has the effect of capping the amount of water that may be allocated to irrigation (by stating areas for which maximum water allocations have been determined) for irrigation districts, private irrigation, and a number of possible irrigation projects, if applications are made.
  - The regulation does not allocate water or establish a priority date for the projects.
  - Irrigation area expansion limits for irrigation districts are now incorporated into the *Irrigation Districts Act*.
- *Irrigation Districts Act*
- *Fisheries Act* (federal)

Policies

- *Water Management Policy for the South Saskatchewan River Basin* (1990)
  - Provides six general policies for water management in the SSRB
- *The Framework for Water Management Planning*
- *Water For Life: Alberta's Strategy for Sustainability*
- *Approved Phase One Water Management Plan for the South Saskatchewan River Basin*
  - Authorizes water allocation transfers and water conservation holdbacks,
  - Provides recommendations to the Director on use of water allocation transfers and water conservation holdbacks, and
  - Provides recommendation to the Director to stop accepting applications for new allocations of water from the St. Mary, Belly, and Waterton rivers.

Licences for Dam Operations

- Licences for dams owned and operated by Alberta Environment, including the Oldman River, Waterton-St. Mary Headworks Project, and Dickson Dam.

Existing Instream Objectives

- Existing instream objectives and WCOs (as described in Appendix 'E').

International and Interprovincial Water-sharing Agreements

- The *Master Agreement on Apportionment*
- The *Boundary Waters Treaty*

Background Studies for the Planning Process

- Water Demand and Consumption
  - South Saskatchewan River Sub-basin Contributions to International and Interprovincial Water-sharing Agreements (Alberta Environment, 2002b)
  - South Saskatchewan River Basin Water Allocation (Alberta Environment, 2003a)

- South Saskatchewan River Basin Non-irrigation Water Use Forecasts (Hydroconsult EN3 Services Ltd., 2002)
- South Saskatchewan River Basin: Irrigation in the 21st Century. Volume 1: Summary Report (Irrigation Water Management Study Committee, 2002)

- Aquatic Environment
  - Instream Flow Needs Determinations for the South Saskatchewan River Basin (Clipperton et al, 2003)
  - Report on Strategic Overview of Riparian and Aquatic Condition of the South Saskatchewan River Basin (Golder Associates, 2003)

- Water Balance Modeling
  - South Saskatchewan River Basin, Water Management Plan, Phase 2, Scenario Modelling Results, Part 1 (Alberta Environment, 2003c)

- Recreation
  - Recreation Flows for the Bow River and its Tributaries, Alberta, 2002. George, C., W. Tymensen and S. B. Rood. Report for Alberta Environment. Lethbridge, Alberta
  - Recreation Flows for Paddling Along Rivers in Southern Alberta, 2001. Rood, S. B., and W. Tymensen. Report for Alberta Environment. Lethbridge, Alberta.
  - Recreation Flows for the Red Deer River, Alberta, 2002. Rood, S. B., C. George and W. Tymensen. Report for Alberta Environment. Lethbridge, Alberta

Appendix F
Previous Instream Objectives (IOs) and Water Conservation Objectives

Red Deer River Basin

On the mainstem reaches, from Dickson Dam to the Saskatchewan border, the following IOs have been applied:

- 8.50 m^3/s (300 ft^3/sec) for irrigation licences.
- 4.25 m^3/s (150 ft^3/sec) for non-irrigation licences.

Bow River Basin

There are five mainstem reaches from Ghost Reservoir to Bassano Dam:

- Ghost Reservoir outlet to Bearspaw Reservoir outlet,
- Bearspaw Reservoir outlet to Elbow river confluence,
- Elbow river confluence to Highwood River confluence,
- Highwood River confluence to Carseland weir, and
- Carseland weir to Bassano dam.

Each reach has an IO, which is based on a relationship known as the 80% habitat fish rule curve. The IOs in these reaches are based on habitat only and do not include water quality (temperature and dissolved oxygen) protection parameters.

The reach below Bassano to the mouth of the river has three IO values:

- 39.6 m^3/s (1,400 ft^3/sec) for all licences except the Eastern Irrigation District (EID);
- 2.83 m^3/s (100 ft^3/sec) for EID's 1963 licence (1903 priority);
- 11.3 m^3/s (400 ft^3/sec) for EID's 1998 licence.

Oldman River Basin

There are six mainstem reaches from the Oldman Reservoir to the mouth:

- Oldman Reservoir outlet to Pincher Creek confluence,
- Pincher Creek confluence to the Lethbridge Northern Irrigation District (LNID) weir,
- LNID weir to Willow Creek confluence,
- Willow Creek confluence to Belly River confluence,
- Belly River confluence to St. Mary River confluence, and
- St. Mary River confluence to the mouth of the river.

Each reach has an IO that is the greater of either the 80% habitat fish rule curve (80 FRC) or the water quality (temperature and oxygen) protection IO flows.

The three Southern Tributaries to the Oldman River each have WCOs established. They are:

- 2.27 m^3/s (80 ft^3/sec) for the Waterton River at the mouth;
- 0.93 m^3/s (33 ft^3/sec) for the Belly River below the Belly River Diversion,
- 2.75 m^3/s (97 ft^3/sec) for the St. Mary River at the mouth.

South Saskatchewan River Sub-basin

From the confluence of the Bow and Oldman rivers to the Saskatchewan border, an IO of 42.5 m^3/s (1,500 ft^3/sec) is attached to licences.